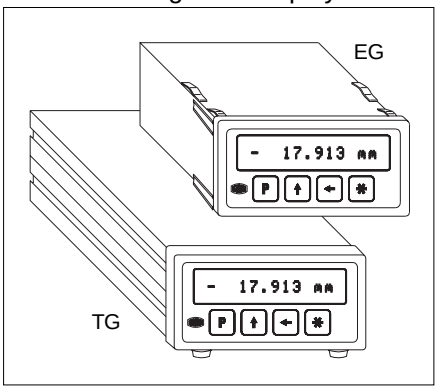
MA100/1

Electronic Magnetic Display



ENGLISH

1. Safety information

• In order to carry out installation correctly, we strongly recommend this document is read very carefully. This will ensure your own safety and the operating reliability of the device.

• Your device has been quality controlled, tested and is ready for use. Please respect all warnings and information which are marked either directly on the device or in this document.

• Warranty can only be claimed for components supplied by SIKO GmbH. If the system is used together with other products, the warranty for the complete system is invalid.

• Repairs should be carried out only at our works. If any information is missing or unclear, please contact the SIKO sales staff.

2. Identification

Please check particular type of unit and type number from the identification plate. Type number and the corresponding execution are indicated in the delivery documentation.

e.g. MA100/1-0023
- 0023: type number
- MA100/1: type of unit

3. Installation

The unit should be used only according to the protection level provided. Protect the unit, if necessary, against environmental influences such as sprayed water, dust, knocks, extreme temperatures.

Built-in housing EG

• Push the device into the panel (1) until the panel clips (2) hold the housing loosely.

Press the lateral centering (3) slightly down and push the housing into the cut-out (1) until the panel clips (2) snap completely.

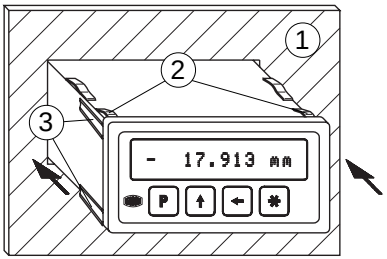


Fig. 1: Installation

Bench housing TG

The rubber feet can be removed in order to screw down the unit.

Attention: Maximum screw length is 6.5 mm!

4. Electrical connection

• Wiring must only be carried out with power off!

• Provide standed wires with ferrules.

• Check all lines and connections before switching on the equipment.

Interference and distortion

All connections are protected against the effects of interference. **The location should be selected to ensure that no capacitive or inductive interferences can affect the display or the connection lines!** Suitable wiring layout and choice of cable can minimise the effects of interference (eg. interference caused by switching power supplies, motors, cyclic controls and contactors).

Necessary steps:

• Only screened cable should be used. Wire cross section is to be at least 0,14 mm^2, max. 0,5 mm^2.

• Wiring to screen and to ground (0V) must be via a good earth point having a large surface area

for minimum impedance.

• The unit should be positioned well away from cables with interference; if necessary **a protective screen or metal housing must be provided.** The running of wiring parallel to the mains supply should be avoided.

• Contactor coils must be linked with spark suppression.

• PE-connection with 2.5 – 4 mm² via PE-clamp (fig. 2).

Power supply

is made via mains connection on rear of the device. The correct supply voltage is indicated in the delivery documentation:

230 VAC -10% ... +6%
or 110 VAC -10% ... +6%
or 24 VDC -20% ... +20%

Sensor connection

via 9-poles rear side SUB-D socket (fig. 2).

Attention! No modifiction of the sensor connection, eg. by cable extension, is permitted.

4.1 Connection, Panel Mounting EG

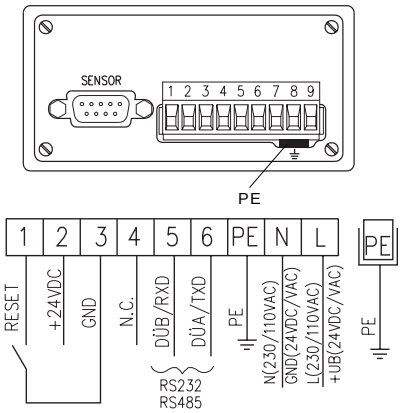


Fig. 2: Pin outs EG

No.	Pin outs
1	RESET
2	U_B = +24V (for reference switch)
3	GND (interface)
4	N.C.
5	RS232 (RXD), RS485 (DÜB)
6	RS232 (TXD), RS485 (DÜA)
7	PE
8	N (230/110 VAC), GND (24 VDC)
9	L (230/110 VAC), U_B (24 VDC)

4.2 Conn., Bench Top Casing TG

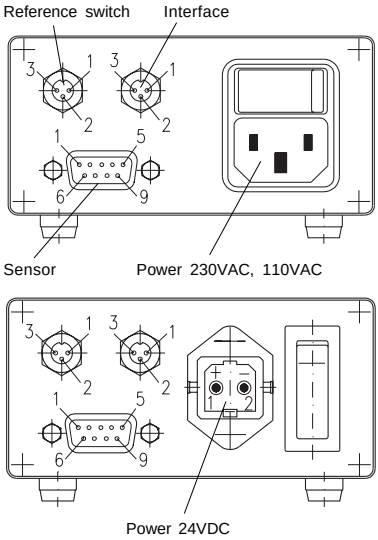


Fig. 3: Rear panel connections TG

Reference switch connection

via a socket at the rear; pin connections are to be made as follows (fig. 3):

No.	Description
1	RFS
2	$+U_B$
3	GND

Interface connection

via a socket at the rear; pin connections are to be made as follows (fig. 3):

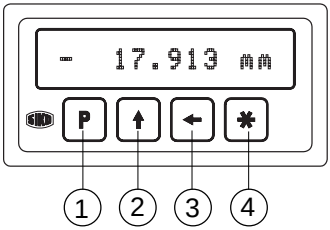
No.	Description
1	TXD / DÜA
2	RXD / DÜB
3	GND

5. Commissioning

Four membrane keys on the front panel are used for programming and operation of the display.

Keys' function

Depending on the operating mode the keys may have additional functions (see 'Programming mode' and 'Input mode'). The keys are pressed singly or in pairs (two together).



1. Programming
2. Select 'value'
3. Select 'digit'
4. Store value

Fig. 4: Key functions

When switched on

and correctly connected:

- the device name is displayed (for approx.1,5 s)
- the software version (eg. 1.00) is displayed

Subsequently the specific parameters of the machine can be programmed.

Operating modes

There are two operating modes accessible via the keyboard:

1. Programming mode: to program the display at initial installation.

2. Input mode: to enter parameters/select functions used during standard operation.

6. Sensor Calibration

In order to minimize possible offset errors within the sensor system, the sensor must be calibrated before the first use of the system or if one system component (display, sensor, magnetic strip) is exchanged.

For calibration, please proceed as follows:

1. Menu point "CALIBR.:" in the programming menu must be set to "ON" and then confirmed by the ✱-key.

2. Move sensor slowly (max. 10mm/s) over at least 10mm in one direction. The displayed values (eg. "OC-001 +004") will then not change anymore.

3. Press key ✱ for storing.

4. Press key P to finish / leave calibration.

7. Programming mode

The MA100/1 is either pre-programmed to standard values at our works or, if the order defines customer-specific parameters, these will be pre-programmed at SIKO. Enter programming mode for parameter modification / programming. Normally programming is only necessary at initial installation. Parameters can be modified and checked at any time. They are stored in a non-volatile memory. Each parameter's designation, function and value range is shown in tables on the following pages.

To enter into programming mode:
Press key P for at least 1...30 s, depending on key programming (see below).

To leave programming mode:
Press key P until the end of the parameter list is reached.

To scroll parameter information:
Use key P

To change parameters:
Use keys ↑ and ←

To store modified parameters:
Press key ✱, then message "SAVING..." will be briefly displayed.

8. Parameter description

At the end of this user information brochure you will find a detailed **parameter list** showing all programmable parameters and offering space for customer-specific programming values .

Display "choice"	**Designation / description**
RESOL:	Resolution: to determine the resolution of the display. Display can be made in [mm] or [inch]. Parameter **"FREE"** allows the programming of a calculating factor.
FAC:	Calculating factor: used to obtain for example an angle display. Basis is the maximal possible resolution of 1/1000 mm. The calculation factor which has to be programmed = measuring range to be displayed / total working range [1/1000 mm]. *Example:* angle measurement

	on a circular disk with a display range of 0 to180°; display in 1/100°; circumference of the circular disk 942,48 mm; hence total working range 471,240 mm;
	FAC = 18000 / 471240 = 0,03820
REF:	Absolute reference point for the measuring system. This value is determined by calibrating the system according to chapter 9.
DEC.:	Decimal point: modification of the decimal point position to determine the resolution, eg. after programming the calculation factor. Up to 5 digits after the comma are possible.
DIR:	Direction: counting direction of the measuring system
"UP"	upward
"DOWN"	downward
P KEY:	Time for which P-key needs to be pressed to enter the programming mode.
RESET:	Reset enable: reset to reference value via key ✱ .
"ON"	Reset function on
"OFF"	Reset function off
ABS/REL:	incremental measurement enable.
"ON"	function on
"OFF"	function off
REF.EN.:	Ref. value input enable: to enter / change calibration value.
"ON"	Reference value change on
"OFF"	Reference value change off
UNITS:	Unit of measure selection.
BRIGHT.:	LED display brightness toggle.
BAUD:	Baud rate: interface's baud rate.
LANGUAGE:	Language: To choose the language displayed
"GER"	German
"ENG"	English
CONTROL:	Nur für Servicezwecke
CALIBR.:	Fine calibration of the sensor. Only has to be carried out before the first use of the system or if system components are exchanged.

9. Input mode

Reset function via keyboard

• Press key ✱ to set the display to the reference value.

Precondition: Parameter 'Reset enable' (RESET) in programming mode must be programmed to "ON", but unit must **not** be left in programming mode (see chapter 7 '**To leave** programming mode').

Reset function via reference input

By short activation (ground switching) of the input RESET eg. by a push button or by using a proximity switch. (Closing contact function)

Incremental measurement

Press key ⇐ for activation.

• The display is zeroed.

• Sign blinks.

• Press key ⇐ to deactivate. The absolute measuring value is displayed again.

Precondition: Menu point 'Incremental measurement enable' (ABS/REL) in programming mode must be programmed to "ON", but unit must **not** be left in programming mode (see chapter 7 ,**'To leave** programming mode').

Reference value modification

For reference value alteration, keys P + ⇑ must be pressed simultaneously.

The display then shows the reference value, which can be changed via the two arrow keys.

Press key ✱ to store the new value.

MA100/1 returns to display mode, if P key is pressed.

Precondition: In programming mode menu points 'Reference value input enable' (REF.EN.) respectively must be programmed to "ON", but unit must **not** be left in programming mode (see chapter 7 ,**'To leave** programming mode').

Display during input mode

1	2	3	4	5	6	7	8	9	10	11	12	
-			1	7	.	9	1	3		m	m	display

No.Digit	Significance
1	sign (blinking during 'incremental measurement')
2 - 9	mearuing value
11 - 12	unit of measure

10. Trouble shooting

Error states are recognized and shown in the display:

Message: OVERFLOW
Description: display overrun
Action: check parameters and adjust them if necessary; set display to reference value

Message: SENSOR
Description: faulty / no sensor signal
Action: check gap between sensor and magnetic strip

Message / Effect: blinking SIGN / MA100/1 cannot be referenced
Description: Display is still in incremental measurement function
Action: Leave incremental measurement function as descriped in chapter 9 or proceed as follows:
1. Enter into programming mode
2. Program parameter 'ABS/REL' to "ON"
3. Leave programming mode
4. Leave incremental measurement function as descriped in chapter 8
5. Enter programming mode again
6. Program parameter 'ABS/REL' to "OFF"
7. Leave programming mode

11. List of commands / service operation

Date: 30.05.1999
Software version: 1.01
Parameters: 1200...19200 Baud, no parity, 8 bit, 1 stop bit, no handshake
Data code: ASCII

Command	Length	Reply	Description
ax	2/8	yyyyyyy(CR)	yyy= Versionstext x=0:unit x=1:software version
l	1/2	> (CR)	Zero-setting
w	1/4	abcd	position value (two's complement) 4 byte
z	1/9	+xxxxxxx(CR)	position value(ASCII)

12. Application Examples

Length measurement

Display resolution 1/1000 mm.
Display shall be zeroed via function key.

Display	Designation	Progr.value
RESOL:	resolution	0.001
REF:	reference value	000.000
DEC.:	decimal point	0.000
DIR:	counting direction	UP
P KEY:	time	1s
RESET:	reset enable	ON
ABS/REL:	incr. meas. enable	OFF
REF.EN.:	reference value enable	OFF
UNITS:	unit of measure	mm
BRIGHT.:	display brightness	38%
BAUD:	baud rate	19200
LANGUAGE:	language	ENG
CONTROL:		OFF
CALIBR.:	fine calibration	OFF

Appendix: Parameter list

Display	Designation / value range	Your programming I	Your programming II
RESOL:	resolution: 0.01, 0.001 (mm) 0.001i, 0.0001i (inch) FREE		
FAC:	calculating factor: (only if resolution has been programmed to 'FREE') 0.00001 ... 9.99999		
REF:	reference value: -999999 ... 999999		
DEC.:	decimal point: 0. bis 0.00000		
DIR:	counting direction: UP , DOWN		
P KEY:	P Key-time: 1s, 5s, 10s, 20s, 30s		
RESET:	reset enable: ON, OFF		
ABS/REL:	incremental measurement enable: ON, OFF		
REF.EN.:	reference value input enable: ON, OFF		
UNITS:	mm, µm, m, cm, °, in, -- (no units)		
BRIGHT.:	display brightness: 4, 8, 15, 23, 38, 60, 100%		
BAUD:	interface 's baudrate: 1200, 4800, 9600, 19200		
LANGUAGE:	GER, ENG		

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